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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,272	12/15/2003	Koenraad F. Van Schuylenbergh	D/A3601	6190

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EXAMINER

GILMAN, ALEXANDER

ART UNIT	PAPER NUMBER
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2833

DATE MAILED: 03/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/737,272

Applicant(s)

VAN SCHUYLENBERGH ET AL.

Examiner

Alexander D. Gilman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 and 33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-29 and 33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Smith et al.

With regard to claims 1-3, Smith et al(US 5,613,861) disclose (Fig. 10-13) an electrical circuit interconnect comprising:

an anchor portion (a portion attached to 3) coupled to a substrate in a substrate plane',
a release portion including a first end coupled to the anchor portion, the
release portion including at least one in-plane curve (Fig. 11, a portion surrounding the
anchor portion), wherein the in-plane curve is in plane approximately parallel to the substrate
plane, the release portion further

including a lift line where an uplift portion of the release portion begins to curve out of
the plane of the substrate', and,

a curved spring tip (Fig. 12, 13) coupled to a second end of the release portion, and
wherein a direction of maximal curvature at the spring tip lies in a plane approximately
perpendicular to the release line.

With regard to claim 2, Smith et al(US 6,361,959) disclose that the release portion is
released from the substrate such that an internal stress gradient (col. 3, lines 10-13) in the uplift
portion causes the uplift portion to curve out of the plane of the substrate.

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With regard to claim 4, Smith et al disclose that the release portion being formed from one of molybdenum, tungsten, chromium, zirconium or nickel, or their alloys (col. 4, lines 44-50)

.With regard to claim 5, Smith et al disclose that the anchor portions

of the electrical interconnect is coupled to an integrated circuit (48).

With regard to claim 6, Smith et al disclose that that the length of the uplift portion is less than 5mm

With regard to claim 7, Smith et al disclose that the release portion

further comprises an unlifted portion (around the anchor portion).

With regard to claims 8, 14, Smith et al disclose (col. 1, lines 7-12) a photoresist and plating procedure

Claims 15-24, 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Beroz et al(US 6,361,959) .

With regard to claims 15, 17, 22, 33 Beroz et al(US 6,361,959) disclose (Fig. 4, 5a, 6a, 8, 23 and Attachment to the to the Office Action filed 08/31/2006)) an electrical circuit interconnect (36) comprising:

an anchor portion coupled to a substrate in a substrate plane',

a release portion including a first end coupled to the anchor portion, the

release portion including at least one in-plane curve (Fig. 5, a, 23), wherein the in-plane curve is in plane approximately parallel to the substrate plane, the release portion further

including a lift line where an uplift portion of the release portion begins to curve out of the plane of the substrate', and,

a spring tip (38) coupled to a second end of the release portion, and wherein a direction of maximal curvature at the spring tip (the vertical plane coplanar with the horizontal direction of

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the tip's curvature being perpendicular to the release line) lies in a plane approximately perpendicular to the release line.

With regard to claims 19, 20, 21, 25 Beroz et al (US 6,361,959) disclose (Fig. 5a) that the release portion includes an aperture, the largest dimension of said aperture exceeding half the median

width of the release portion.

With regard to claim 16, Beroz et al (US 6,361,959) disclose that the uplift portion (Fig. 23) includes no curves (while the release portion includes in plane curved section (738)).

With regard to claim, 18 Beroz et al (US 6,361,959) disclose (Fig. 7) a photoresist and plating procedure

With regard to claim 23, Beroz et al (US 6,361,959) disclose that the length of the uplift portion is less than 5mm (col. 8, lines 10-13)

Claims 25-29 are rejected under 35 U.S.C. 102(b) as being anticipated by DiStefano et al (US 5,859,472). With regard to claim 26, DiStefano et al (US 5,859,472) disclose (Fig. 5-7) an electrical interconnect comprising:

an anchor portion (16); and,

a stressed metal spring (r. n. 15 and col. 2, lines 63-65) coupled to the anchor portion, the spring including an aperture in

the spring, the entire perimeter of the aperture bounded by spring material the largest dimension of the aperture exceeding 50% of the width of the spring,

a tip (35) coupled to an end of the stressed metal spring (col. 8, lines 33-36) wherein the tip points (Fig. 3) in a direction that is non-parallel to the substrate plane.

With regard to claim 27, DiStefano et al (US 5,859,472) disclose that the width of the

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aperture is at least 0.05 micrometer

With regard to claim 28, DiStefano et al (US 5,859,472) disclose that the width of the aperture exceeds the average width of the spring.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3, 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of DiStefano et al or Beroz et al.

With regard to claims 3,9-12 DiStefano et al (US 5859,472) disclose that the plurality of in plane curves in the uplift portion subtends an angle that totals approximately zero degrees (Fig. 5)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the spring contact with a plane curves , as taught by DiStefano et al , to reduce stress concentration in spring contact (DiStefano, col. 9, lines 10-13)

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Smith et al in view of Zhang

Zhang (US 6,489,248 disclose (col. 3, lines 1-30) using small openings for regulation of etching process

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Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over DiStefano et al

With regard to claim 29, DiStefano et al (US 5,859,472) disclose

a first flexible supports on a first side of the aperture,

a second flexible support on a second side of the aperture,

Applicants have presented no argument which convinces that the geometrical limitations regarding the width of the flexible supports is significant or is anything more than one of numerous configurations a person of ordinary skill in the art would find obvious for purpose of adding the additional flexibility of the interconnect. In re Dailey, 149 USPQ 47 (CCPA 1976).

Response to Arguments

Applicant's arguments regarding claim 15, filed 01/11/2006 have been fully considered but they are not persuasive. Applicant argues that Beroz is insufficient to disclose an in-plane curve of the release portion.

According to the attachment to the office action filed 08/2005 Fig. 5 a of Beroz et al is interpreted a portion which surrounds the anchor portion as an in-plane curve of release portion, since the interconnect includes just two components - the anchor portion and the release portion. Everything of the interconnect which is not an the anchor portion (the disc) is considered as a release portion

Also Applicant argues that DiStefano does not disclose compressive stresses and a tensile stresses in the respective layers of the spring.

However, DiStefano et al teach bending forces which cause stress. As it known from Strength of Materials, bending forces produce compressive stress and tensile stress in the respective layers.

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Applicant's arguments with respect to claims 1, 33, have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander D. Gilman whose telephone number is 571 272-2004. The examiner can normally be reached on Monday-Friday, 10:30 a.m. - 8:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571 272-2800 ext. 33. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

03/17/2006



ALEXANDER GILMAN
SENIOR EXAMINER